

**COATING APPARATUS AND METHOD**

The present invention relates to apparatus and methods for coating the human body. More particularly the present invention relates to apparatus and methods  
5 for applying cosmetic and therapeutic compositions on the human body.

**BACKGROUND**

Since ancient times humans have applied various compositions to their bodies for cosmetic and therapeutic purposes. Examples of compositions include  
10 moisturisers, sun protection lotions, artificial tanning compositions, pharmaceutical compositions and the like. These compositions have been traditionally applied by hand. It is also known in the art that some compositions may be applied with a spray device, such as sun protection lotions and artificial tanning substances.

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A problem in the application of compositions to the skin is that the absorption of the active ingredient(s) in the compositions can be quite variable. This leads to difficulties in obtaining reproducible and consistent results. An easily visualised example of this problem can be seen in the application of artificial tanning  
20 compositions to the skin. It is a recognised problem in the field of artificial tanning that different parts of the body absorb the active ingredient in the tanning composition to varying extents, leading to a "patchy" and a generally aesthetically unacceptable result.

25 Another problem that is especially prevalent in the field of artificial tanning is that many individuals feel uncomfortable about removing their clothing outside the security of their home. While spray-on tanning salons have been very popular, modesty is a significant problem for many users and a barrier to market expansion.

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A further problem relates to the fact that spray-on tanning booths are expensive and require a certain amount of floor space for installation. This has precluded the use of these booths in the home, as well as the wide acceptance of these contrivances in many professional salons.

There is therefore a clear need to provide an apparatus that is able to improve on the lack of uniform absorption of compositions on the skin. There is also a need in the art for a spray-on tanning apparatus that is adapted for use in the home, relatively inexpensive while conserving floor space.

It is an aspect of the present invention to overcome or alleviate a problem of the prior art.

The discussion of documents, acts, materials, devices, articles and the like is included in this specification solely for the purpose of providing a context for the present invention. It is not suggested or represented that any or all of these matters formed part of the prior art base or were common general knowledge in the field relevant to the present invention as it existed in Australia before the priority date of each claim of this application.

#### SUMMARY OF THE INVENTION

In one aspect, the present invention provides an apparatus for applying a composition to the skin, the apparatus including a chamber, the chamber including means for washing the skin, and means for applying the composition. Applicants have recognised that incorporating means for washing the skin into a chamber designed for applying a composition to the skin provides a number of advantages such as removal of foreign matter from the skin, and also removal of a proportion of the stratum corneum immediately prior to the removal of a composition such as an artificial tanning agent. Removal of dead skin cells and other contaminants from the skin immediately before the application of a composition improves the reproducibility of the absorption of the active ingredient in the composition.

In a preferred form of the invention the means for washing the skin is capable of directing water toward a central region of the chamber such that the head and/or torso and/or leg region of the user is exposed to the water.

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A further major advantage is that the present invention lends itself to the easy incorporation of spray-on tanning technology into the home or commercial environment since an existing shower recess may be converted into a combined shower and artificial tanning chamber. Conversion may be achieved using a retrofitting kit, or a self-contained shower/spray-on tan unit that may be incorporated to the existing plumbing of a standard shower recess.

In addition to the ability to improve the application of artificial tanning compositions, installation of the present invention is significantly less expensive than separately installing a shower recess and spray-on tanning booth. A further advantage is that floor space is saved by combining a shower recess and spray-on tanning booth. Yet a further advantage is that the user does not need to walk in a state of undress from the shower recess to the tanning booth in a public spa or salon. To the best of the applicant's knowledge, nowhere in the prior art has there been disclosed a spray-on tanning booth having these advantages.

In a further preferred form of the invention the apparatus includes means for steam generation. The effect of steam assists in the initial cleansing process leading to more uniform absorption of the composition. Under these conditions, subcutaneous blood flow is stimulated leading to enhanced cleansing of the pores of the skin, as well as natural exfoliation.

The apparatus may further include means for evaporating moisture from the surface of the user. The means could be a fan capable of exhausting the humid air from the chamber leading to the ingress of drier air. This in turn leads to the evaporation of moisture from the skin of the user thereby cooling the skin. The constriction of capillaries and pores follows. This process better prepares the skin for application of the tanning composition.

In another aspect, the present invention provides a method of coating the skin with a composition, the method including the steps of entering a chamber including means for washing the skin, means for applying the composition, and means for removing effluent from the chamber, washing the skin using the

means for washing the skin, and applying the composition to the skin using the means for applying the composition.

The present invention contemplates the use of many compositions, including  
5 but not limited to self-tanning formulations, sunscreens, suntan lotions, tanning  
accelerators, sunburn treatments, insect repellants, skin toners, skin bleaches,  
skin lighteners, anti-microbial compositions, moisturizers, exfoliants, nutriment  
or vitamins, massage aides, muscle relaxants, skin treatment agents, burn  
treatment agents, decontamination agents, cosmetics, wrinkle treatments or  
10 removers, scents and aromas. A preferred form of the invention is directed to  
the application of artificial tanning compositions.

Throughout the description and the claims of this specification the word  
"comprise" and variations of the word, such as "comprising" and "comprises" is  
15 not intended to exclude other additives, components, integers or steps.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 shows a perspective view of an apparatus of the present invention.  
The embodiment shown is that of a domestic shower recess equipped with a  
20 plurality of spray heads designed to deliver composition.

Figure 2 shows a front cutaway view of a self-contained, wall-mounted  
embodiment of the invention.

25 Figure 3 shows a lateral view of the apparatus of Figure 2.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

In one aspect, the present invention provides an apparatus for applying a  
composition to the skin, the apparatus including a chamber, the chamber  
30 including means for washing the skin, and means for applying the composition.

Applicants have recognised that incorporating means for washing the skin into a  
chamber designed for applying a composition to the skin provides a number of  
advantages. The skin of most people is covered in material such as

moisturisers, cosmetics, deodorants, antiperspirants, fragrances, pollution, oils, salts, dead skin cells, bacteria and the like. These materials can form a barrier to the even deposition of compositions on the skin. Removal of these products from the skin immediately before the application of a composition improves the reproducibility of the absorption of the active ingredient in the composition. It has also been discovered that the application of steam to the skin before the application of artificial tanning compositions assists in the cleansing process leading to more even colouring.

Applicants have further recognised that washing the skin immediately before the application of a composition removes a proportion of the stratum corneum, the top most layer of skin that is thickened and generally impermeable to active compounds. In the field of artificial tanning, the stratum corneum acts to preferentially absorb substances such as dihydroxyacetone. Therefore, if an effort is not made to remove a proportion of this skin layer, an uneven tan will result.

A further major advantage is that the present invention lends itself to the easy incorporation of spray-on tanning technology into the home. An existing shower recess may be converted into a combined shower and tanning chamber. Persons concerned with removing their clothing in a foreign environment are able to apply artificial tanning compositions and the like in the comfort and security of their own home.

In a preferred form of the invention the apparatus is a self-contained unit that can be attached to the wall and adapted to be connected to the existing plumbing in a shower recess, thereby augmenting or taking the place of the existing shower head. An embodiment of this form of the invention is shown in Figures 2 and 3. In one form of the invention the unit includes at least one reservoir for containing a composition such as an artificial tanning composition or moisturiser etc., the reservoir being connected to a pump which is in turn connected to a plurality of atomising nozzles directed into the shower recess. The unit may also include a "body shower" featuring a plurality of longitudinally disposed water jets. The water jets are supplied from the hot and cold mains



water supply via a mixer valve. The unit may also contain a plurality of steam outlets supplied by the mains hot water, or a separate steam generating unit. Because the unit may completely take the place of the existing shower, the unit may also include a standard shower head. Typically, the self-contained unit will  
5 be about 1300mm high x 275mm wide and about 130mm deep.

This self-contained unit may have 6 to 12 tan spray nozzles that supply the tan solution from a reservoir and a pump that are mounted inside the unit. The pump can be manually operated without electrical connection or by  
10 electrical/low voltage, or battery. The delivery of composition may also be driven via an aerosol can that can be located inside unit. The aerosol can may contain the tan solution, or simply supply the gas propellant.

Another reservoir is allowed for, so that other solutions may be utilised –  
15 moisturisers, aromas, disinfectants and the like, again using all means for pumping and atomising methods including aerosol cans.

Steam or hot atomised water can be sprayed through 3 to 6 nozzles/outlets located on the unit. A real steam generator may be installed inside the unit or  
20 remote from the unit (nearby the shower room, for example) or hot water may be atomised. A foot-rest may be moulded in the front of the unit enclosure so that bather can rest leg in order to rub solutions into legs without excessive bending on the part of the user.

25 The provision of a self-contained unit adapted for installation in a domestic shower recess that is capable of delivering a spray-on tan composition provides a number of substantial advantages in addition to those disclosed *supra*. Firstly, installation of the unit does not require the use of floor space over and above that required for the existing shower recess. Secondly, the unit is of  
30 substantially reduced cost compared to a separate shower recess and spray-tanning booth, given that the existing shower recess is exploited as a chamber. Thirdly, the user is able to dispense artificial tanning compositions in the home and does not need to attend a salon. Many potential users of artificial tanning

compositions are reticent to remove their clothing outside the home, this being a significant barrier to the broader use of tanning compositions in the market.

The present invention also provides further advantages in a commercial setting.

5 Many salons are hesitant to purchase a spray-tanning booth for a number of reasons including cost, floor space requirements and uncertainty as to whether the booth will attract sufficient custom to justify the cost. By combining a shower and spray-tanning function, the present invention provides a multi-functional unit. For example, the shower component could be used alone for  
10 washing mud, seaweed or other compositions from the skin of a user after a treatment. Thus, the booth would not be required to derive all income solely from the application of artificial tanning compositions.

As mentioned, the apparatus may be used in a commercial setting such as a  
15 tanning salon. In this case, it is more likely that the apparatus would be a completely purpose-built device rather than an existing shower cubicle that has been retrofitted with means for applying the composition. It will be appreciated however, that such a purpose-built device could also be used in a domestic setting.

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It will be appreciated that the advantages with respect to floor space savings, cost savings, and multifunctionality are in addition to the advantages afforded by the ability of the user to gain more even penetration of the composition into the skin. The ability of a user to remove contaminating substances from their  
25 skin immediately before the application of a spray-tan composition is key to providing a superior cosmetic result. A user will be more likely to perform this crucial cleansing step if the means for washing the skin and means for applying the composition are in the same unit. Indeed, incorporating the means for washing the skin into apparatus provides a reminder to the user to complete this  
30 important step before application of the artificial tanning composition. Furthermore, the present invention obviates the need for the user to walk from a shower cubicle to a spray-tanning booth in a state of undress.

Turning to the drawing of Figure 1 there is represented one embodiment of the invention showing two walls 2 of the chamber, to which is attached a plurality spray heads 4 for applying the composition. A pump 6 supplies the composition under pressure to the spray heads 4 via conduits 8. The chamber also includes  
5 a shower head 10 that is supplied with mains pressure water via the taps 12. The floor of the chamber 14 is fitted with a drain 16 to remove effluent from the chamber.

The means for washing the body may be any means capable of depositing  
10 water or any other cleaning solution on the body such as a device that delivers water in the form of a jet or a spray. Preferably, the water is directed toward a central region of the chamber where the user would normally be positioned. More preferably, the water is directed or provided at a pressure such that the walls of the chamber are not exposed to a large amount of water. The skilled  
15 person will be familiar with a range of devices suitable for use with the present invention. One such device is a "body shower" including a number of longitudinally disposed jets or sprays that act to direct water to the head, torso and leg region of the user. Another device that will be useful as a means for washing the body is a shower head of the type often used in a domestic setting.  
20 In another form of the invention the chamber includes means for removing effluent from the chamber such as a drain of the type often used in a domestic setting.

The means for applying the composition may be any means capable of  
25 depositing the composition on the body. Preferably the means for applying the composition relies on atomisation of the composition. The skilled person will be familiar with many means for atomising a composition including but not limited to the following: air atomisation, siphon feed, gravity feed, pressure feed, internal atomisation, external atomisation, low pressure low volume, high  
30 volume low pressure, airless atomisation, pressurized through small orifices, air-assisted, air-assisted heated, electrostatic, using charged particles, heated charged particles, high speed rotational atomizers, and ultrasonic.



The present invention also contemplates the use of other processes such as vaporization, misting and nebulization.

The means for applying the composition may be static, or may move.

5 Alternatively, the person may be on a rotating platform during application of the composition. The means for applying the composition may be positioned in any area within the chamber so long as a sufficient and even coating of composition is capable of being applied to the desired area(s) of the body.

10 In a preferred embodiment the chamber is a shower recess or shower cubicle commonly used in domestic bathrooms. The walls of the chamber may be solid, or may be a curtain, or a combination of both. Furthermore, the chamber may be any shape. The main function of the chamber is to minimise the escape of water or composition or steam from the general environs of the user. The  
15 chamber does not necessarily need to completely surround the user, and may include only three sides for example. In one form of the invention the chamber is completely enclosed. Another function of the chamber is to prevent soiling of the surroundings with composition or water. This is especially important in the application of artificial tanning compositions since these compositions tend to  
20 stain.

The present invention may also include means for generating steam. As used herein the term "steam" is intended to include water vapour produced by heating liquid water to about 100°C. The term is also intended to include water  
25 vapour produced by heating water to temperatures as low as about 40°C. Also included in the term "steam" is atomised hot water of between about 40°C to about 100°C. Most usually the hot water is atomised at a temperature of about 50°C to about 55°C. Other means for generating steam are well known, and the skilled person will be able to select other methods from those known in the  
30 sauna industry. The effect of steam assists in the initial cleansing process leading to more uniform absorption of the composition. Under these conditions, subcutaneous blood flow is stimulated leading to enhanced cleansing of the pores of the skin, as well as natural exfoliation. The steam may be activated for from about 2 minutes to about 7 minutes at between about 43°C to about 46°C.

The apparatus may further include means for evaporating moisture from the surface of the user. The means could be a fan capable of exhausting the humid air from the chamber leading to the ingress of drier air. This in turn leads to the evaporation of moisture from the skin of the user thereby cooling the skin. The constriction of capillaries and pores follows. This process better prepares the skin for application of the tanning composition.

In another aspect, the present invention provides a method of coating the skin with a composition, the method including the steps of entering a chamber including means for washing the skin, means for applying the composition, and means for removing effluent from the chamber, washing the skin using the means for washing the skin, and applying the composition to the skin using the means for applying the composition.

In a preferred form of the invention the washing step includes the use of an exfoliant. The exfoliant may be in the form of a mildly abrasive composition, or an implement such as a brush, coarse cloth or the like.

In a preferred form of the method the method includes the step of exposing the skin to which the composition is to be applied to steam. This assists in preparing the skin for the application of the composition. This step may occur at any stage of the process but is preferably after the washing step.

Another step that may be incorporated into the present method is the application of a moisturizer, either before or after the application of the tanning composition. This can be accomplished using the means for applying the composition in the chamber.

The present invention contemplates the use of many compositions, including but not limited to self-tanning formulations, sunscreens, suntan lotions, tanning accelerators, sunburn treatments, insect repellants, skin toners, skin bleaches, skin lighteners, anti-microbial compositions, moisturizers, exfoliants, nutriments or vitamins, massage aides, muscle relaxants, skin treatment agents, burn

treatment agents, decontamination agents, cosmetics, wrinkle treatments or removers, scents or aromas. In a preferred embodiment of the invention the composition is an artificial tanning composition.

- 5 By way of more specific examples many artificial tanning compositions are known in the art and include active ingredients that do not chemically alter the skin (e.g. bronzers) as well as those that chemically interact with the skin (e.g. dihydroxyacetone). Examples of artificial tanning compositions suitable for use in the context of the present invention follow:

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**Composition 1**

Ingredient	%
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15 Dihydroxyacetone	3
Water	97

**Composition 2**

Ingredient	%
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20 Dihydroxyacetone	3.0
Denatured Ethanol	20.0
Water	77.0

**Composition 3**

Ingredient	%
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25 Dihydroxyacetone	12.0
Denature Ethanol	20.0
Water	68.0

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**Composition 4**

Ingredient	%
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Dihydroxyacetone	10.0
Commercial Sunless	
35 Tanning Lotion	15.0
Water	75.0

**Composition 5**

Ingredient	%
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40 Dihydroxyacetone	9.0
Commercial moisturizer	20.0
Citric acid	0.3
Commercial bath product	0.6
Bronzer	6.0
45 Water	64.1

Other colourants may also be used, such as crotonaldehyde, pyruvaldehyde, glycolaldehyde, glutaraldehyde, ortho-phthalaldehyde, sorbose, fructose, erythrulose, methylvinylketone, or food coloring.

- 5 By way of example, a suitable commercial moisturizer would include Vaseline Brand Intensive Care Aloe and Naturals lotion (Chesebrough-Ponds, Greenwich, Conn.), and a suitable commercial bath product would include Vaseline Brand Intensive Care Foaming Creme Bath (Chesebrough-Ponds, Greenwich, Conn.). The bronzer is a combination of FD&C dyes that yield a  
10 golden brown color.

By way of further example, a bronzer composition useful in the context of the present invention follows:

15 **Composition 6**

<u>Ingredient</u>	<u>%</u>
Bronzer	8.0
Commercial moisturizer	20.0
Commercial bath product	0.6
20 Ethoxydiglycol	2.0
Water	69.4

- By way of example, a suitable commercial moisturizer would include Vaseline Brand Intensive Care Aloe and Naturals lotion (Chesebrough-Ponds,  
25 Greenwich, Conn.), and a suitable commercial bath product would include Vaseline Brand Intensive Care Foaming Creme Bath (Chesebrough-Ponds, Greenwich, Conn.). The bronzer is a combination of FD&C dyes that yield a golden brown color. Other colourants such as lawsone and juglone may be used.

- 30 By way of further example, suitable commercial preparations useful in the context of the present invention include Coppertone®. Oil-Free Sunless Tanner (Schering-Plough, Memphis, Tenn.), Neutrogena®. Glow Sunless Tanning Lotion for Face and Body (Neutrogena, Los Angeles, Calif.), and Kroger®.  
35 Sunless Tanning Cream (Kroger, Cincinnati, Ohio).

It will be apparent that the present invention will have particular use in the application of sunscreen after a shower. This will be particularly useful in countries where skin cancer is of particular concern, and especially for children for whom application of sunscreen is difficult.

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The compositions may be in any form, for example a solution, a slurry, a suspension, a colloidal suspension, an oil in water emulsion, a water in oil emulsion, and the like. The skilled person will be able to establish the best means for applying any given composition according to the present invention.

10

For example, it will be immediately apparent that compositions having a more viscous consistency will be more difficult to atomise by passing the composition through an orifice. Accordingly, the spray head may require an aperture of a larger diameter, or a pump capable of supplying the composition to the aperture at a higher pressure in order to overcome the natural tendency of a viscous

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liquid to occlude the aperture.

Finally, it is to be understood that various other modification and/or alterations may be made without departing from the spirit of the present invention as outlined herein.

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